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THE DEPARTMENT OF ENERGY'S ROLE IN ADVANCING THE NATIONAL, ECONOMIC, AND ENERGY SECURITY OF THE UNITED STATES

THURSDAY, SEPTEMBER 15, 2016

House of Representatives,

Subcommittee on Energy and Power,

Committee on Energy and Commerce

Washington, D.C.

The subcommittee met, pursuant to call, at 10:00 a.m., in Room 2322 Rayburn House Office Building, Hon. Pete Olson presiding.

Members present: Representatives Olson, Barton, Latta, Harper, McKinley, Kinzinger, Griffith, Johnson, Flores, Mullin, Upton (ex officio), Rush, McNerney, Tonko, Engel, Green, Capps, Doyle, Castor, Sarbanes, Welch, Yarmuth, and Pallone (ex

officio).

Staff present: Will Batson, Legislative Clerk, Energy & Power; Blair Ellis, Digital Coordinator/Press Secretary; Tom Hassenboehler, Chief Counsel, Energy & Power; Robert Ivanauskas, Detailee, Energy & Power; A.T. Johnston, Senior Policy Advisor; Ben Lieberman, Counsel, Energy & Power; Brandon Mooney, Professional Staff Member, Energy & Power; Mary Neumayr, Senior Energy Counsel; John Ohly, Professional Staff, Oversight & Investigations; Dan Schneider, Press Secretary; Peter Spencer, Professional Staff Member, Oversight; Andy Zach, Counsel, Energy & Environment; Jean Fruci, Minority Energy and Environment Policy Advisor; Rick Kessler, Minority Senior Advisor and Staff Director, Energy and Environment; John Marshall, Minority Policy Coordinator; Dan Miller, Minority Staff Assistant; Alexander Ratner, Minority Policy Analyst; Tim Robinson, Minority Chief Counsel; Andrew Souvall, Minority Director of Communications, Outreach and Member Services; Tuley Wright, Minority Energy and Environment Policy Advisor; and C.J. Young, Minority Press Secretary.

Mr. Olson. This hearing will finally come to order. Obviously, four votes and members going home have put a time crunch on this committee.

I want every member to know, whether you're Republican or Democrat, ten terms or your first term, you will have a chance to ask our witness your questions.

But that means I'll be very aggressive with the gavel to ensure you stick to the five-minute limit, and here's my example. I give myself five minutes for an opening statement.

America is back. We are an energy superpower. That statement would have sounded odd a handful of years ago and laughable in the 1970s.

But the fact is we are awash in energy. Today, we are the world's leading producer of oil gas and we are less reliant upon foreign sources of energy.

Our resources are plentiful and affordable -- so affordable that low prices have become a common complaint back home in Houston, Texas, except for my daughter in college who now has more money from her allowance. Instead of buying gasoline, she goes to Starbucks more often.

This subcommittee has been hard at work to bring energy policy into the 21st century and we are beginning to see positive effects. Since we have lifted the ban on crude exports last year,

American oil is spreading all across the globe. We are undercutting OPEC and Russia, helping our allies and giving American workers an opportunity to compete. Natural gas imports are ramping up as well, a trend that's likely to continue if we get the permitting process right.

Unlike other energy commodities, you have to ask DOE for a permit to export natural gas. Unfortunately, these are applications that have been held up at DOE and sometimes for at least three years without a decision.

These delays are jeopardizing major construction projects and threatening American jobs. We have the opportunity for jobs and affordable energy right here at home and to our allies abroad.

But there is still much work to be done. It is hard to build infrastructure in this country. Yes, my own state of Texas has plenty of oil and gas to serve our homes and our businesses. But our friends in New England face gas shortages and price spikes because it is almost impossible to build a pipeline.

In other parts of the country people pay more than they should for electricity because of harmful EPA regulations. We are using our Energy Conference with the Senate to examine ways to improve infrastructure permitting plus a whole host of other topics such as grid and cybersecurity, energy efficiency and workforce development.

Likewise, we are in an era of abundance at home and must be vigilant concerning emergency preparedness. For example, the nation's Strategic Petroleum Reserve -- the SPR -- is aging rapidly and the DOE's long-term strategic review, at least last week, raise very serious issues about the ability of the SPR to meet its mission.

According to the report, the SPR may only be able to effectively distribute about half as much of the oil it is designed to supply in an emergency -- one half.

Congress has authorized $2 billion for SPR infrastructure modernization. But before that can be approved we need the department to be open and transparent about the condition of SPR and the funds required to rehabilitate it.

We want to make DOE a bigger part, a critical part, of our emergency response and that's why we used last year's FAST Act to grant new emergency authorities and procedures to act in some specific cases.

However these limits -- there are limits to this authority that we give DOE. Any new requests will be closely scrutinized.

Again, thank you for joining us today, Mr. Secretary. I am proud that this hearing, just like last week's, will mostly be bipartisan. Everybody on this dais wants the same thing -- an energy economy that brings jobs and creates security at home with

opportunities to advance our interests overseas.

And I yield back the balance of my time and recognize the ranking member of the full committee, Mr. Pallone, for an opening statement for five minutes.

Mr. Pallone. Thank you. Thank you, Chairman, for holding today's hearing evaluating the Department of Energy's work on energy security here in the United States and I'd like to welcome Secretary Moniz back and thank him for his efforts to provide us all with a more secure energy future.

This is an important topic but the realities of energy security are changing as our energy mix changes. We can no longer simply look at oil supply when we think about energy security.

Our country must take a broader approach that encompasses cleaner energy technologies including renewable energy technologies, which are becoming more affordable.

And beyond the realities of our energy mix we must recognize the impacts climate change is having on energy security here in the United States and abroad.

Our nation is not alone in this. The G-7 Energy Initiative for Energy Security states, and I quote, "that reducing emissions from fossil fuels is necessary to tackle climate change and can enhance our energy security."

Simply put, an energy future that reduces our carbon

emissions and our reliance on fossil fuels is a more secure energy future. But simply recognizing and identifying issues affecting our energy security is not enough. We must take real action to enhance and protect our energy infrastructure. I have championed two critical proposals borne out of DOE's quadrennial energy review -- one to support state efforts to modernize and harden the electricity grid and the other to encourage investment in the repair of old leaking natural gas pipeline infrastructure in major metropolitan regions.

And to make our energy future more secure, we must make serious investments in our aging and often outdated energy infrastructure.

I would be remiss if I did not also mention the energy bill conference. Along with my colleagues who sit on the conference committee, we have started the difficult process of merging two very different bills, and while some progress has been made there are still many contentious issues to be resolved and I have made it clear that one of my top priorities in any final energy conference report is providing investments in our energy infrastructure to address some of the needs outlined in the QER such as grid modernization.

Mr. Chairman, the energy sector in 2016 looks vastly different than it did the last time we passed major energy

legislation. Changes in energy markets, new technologies, improved efficiency and shifting consumer demand are all transforming how we think about energy security.

Secretary Moniz, I want to thank you for bringing this conversation to the forefront and for your work to bolster our energy and overall national security and I look forward to your testimony.

And I would like to yield the remainder of my time to Mr. McNerney.

Mr. McNerney. Well, first of all, I want to thank the chairman for holding this hearing. Energy is an issue I care deeply about I am glad to hear -- have a chance to hear from Secretary Moniz.

Mr. Secretary, I am always happy to have you in front of our committee to give us the latest information on what's happening at the DOE and around the country in the energy sector.

I doubt if anyone in our country is more knowledgeable than you are and you have the gift of being able to traverse the political landscape without too many scars to show. So congratulations.

Our nation's energy system works reasonably well most of the time, providing electricity, natural gas, oil and coal reliably and at an affordable cost.

This has been one of the foundations of our nation's economy and security. Because of this, most people take our energy system for granted until the disruption takes place such as an oil shortage or oil price spikes, large power failures or climate-caused disasters.

It is our and your responsibility, Mr. Secretary, to make sure that the energy systems continue to operate smoothly and reliably. This means the proper regulatory framework be in place to encourage the investments needed to keep our energy systems operating and up to date with the challenges we face of new technology, changing demand, a changing generation -- new sources of oil and gas -- retiring nuclear plants and the different threats to our energy systems.

The quadrennial energy review along with other statutes such as the FAST Act and the pending North America Energy Security and Investment Act are designed to make sure that we succeed in keeping our energy system in good condition.

And that brings us to today's hearing. Mr. Secretary, I look forward to your testimony and to the back and forth that will follow to help me increase my understanding of our successes and of the challenges that remain.

Mr. Chairman, I yield back.

Mr. Olson. Gentleman yields back and right now it is time

our distinguished witness to speak for five minutes. Mr. Moniz -- he is our secretary of energy, a regular here at the committee.

You have an invitation in December to come to Thompsons, Texas and see the energy at Petra Nova project. As you know, my friend, that's the first viable carbon capture enhanced oil recovery situation in the whole country. So invitation and five minutes for your opening statement.

STATEMENT OF THE HONORABLE ERNEST MONIZ, SECRETARY, U.S. DEPARTMENT OF ENERGY

Secretary Moniz. Thank you, Vice Chairman Olson and Ranking Member Pallone and members of the subcommittee.

I am very pleased to be here to discuss our role in energy security. U.S. energy security must be considered in the context of the changing U.S. energy profile, the evolving threat environment and the global security challenges facing our country and our allies in various regional settings.

The U.S. is now the number-one producer of liquid fuels and of natural gas in the world but remains a major importer of crude oil. The unconventional production locations of the new supply creates infrastructure challenges and the spread between U.S. and European and Asian natural gas prices has been reduced considerably.

Renewable energy technology development is rising -- deployment is rising rapidly as costs continue to fall. Energy efficiency policies and technologies are contributing to slow growth in demand for electricity and flat or declining demand for oil even as our economy grows.

Natural gas has replaced coal as the largest fuel source for power generation. This dramatically changed and changing energy

landscape faces an evolving set of threats as well and the structure and nature of our energy emergency responses must keep pace with reality.

We know that adversaries and homegrown actors are interested in the vulnerabilities of our critical infrastructures. Threats to our infrastructure includes severe weather, storm surges, exacerbated by rising and warming seas, earthquakes, wildfires, EMP, aging infrastructure, cyber threats, kinetic attacks and growing infrastructure interdependencies.

In response, there are now a range of laws, actions and presidential directives and orders designed to protect our citizens, the economy and critical infrastructures from those with malevolent intent and from the effects of natural disaster.

Challenges like these underscore the need to rethink energy security in light of modern, domestic and global energy markets -- the subject of this hearing.

In June 2014, the G-7 and the EU endorsed a set of seven modern energy security principles. These principles are premised on the recognition of energy security as a collective responsibility among allies and friends. The first two principles deal with market structures, flexible, transparent and competitive energy markets, diversification of fuels, sources and routes, including indigenous sources.

The next three principles highlight the transition to a low-carbon economy through clean energy and efficiency, innovation and deployment as key to enduring energy security.

And the last two principles deal with the need for energy infrastructure resilience and effective response to disruptions of all types including the need for strategic reserves.

We have appreciated working with this committee and with Congress more broadly in responding to some of the resilience and response challenges and, as called for in the FAST Act, are working with the Department of State on an energy security evaluation strategy -- study, excuse me.

In the remainder of this opening statement, I am just going to highlight a few points in my written submission to the committee.

On oil, first, even with strong domestic production the U.S. remains directly tied to global oil markets, price volatility and potential market disruptions.

Second, the Strategic Petroleum Reserve remains essential to ensuring the U.S. economy can withstand serious oil supply disruptions and associated spikes in petroleum prices.

The administration recommended in the QER and Congress authorized through the bipartisan Balanced Budget Act an investment of up to $2 billion in SPRO facilities and marine

terminal infrastructure modernization.

The long-term strategic review of the SPRO required by that act was submitted to Congress in August.

Natural gas -- the key issue on natural gas in energy security is the progress towards global natural gas markets principally through LNG developments. Increased U.S. natural gas production has contributed to a more financially liquid and competitive international and natural gas market which has improved global energy security for U.S., our neighbors, partners and allies.

Physical exports of LNG from the lower 48 started in February of this year. Four more facilities are under construction. The U.S. entry into world LNG markets will also put downward pressure on European gas prices and could constrain the noncompetitive practices of Russia.

The widening of the Panama Canal is coincident with growing U.S. LNG exports, thereby lowering supply chain costs from the Gulf to the Pacific Basin.

Electricity -- the grid faces a lot of new demands based on new technologies for both generation and distribution and the need to address a new set of vulnerabilities, institutional inertia, a complex jurisdictional environment and a mix of delivery service models.

The second installment of the QER, due later this year, will examine the issues confronting the nation's electricity system. It'll make policy recommendations on a range of issues including the changing generation mix, low load growth, increased vulnerabilities, the severe weather and climate change and cyber, new technologies emerging, physical threats as well as cyber, aging infrastructure and workforce, jurisdictional issues, value creation and the need for an integrated North American electricity market.

DOE's grid modernization initiative complements the QER analysis by providing technology and system solutions. The majority of our national labs are directly involved in this.

A key dimension of our efforts is our engagement with industry, especially through the Electricity Subsector Coordinating Council that bring together key federal agencies and electricity sector leaders around resilience and emergency response issues.

Finally, the question of emergency authorities -- with the FAST Act of last year, Congress provided DOE with a new authority to protect and restore critical infrastructure when the president declares a grid security emergency, enabling DOE to support preparation for and response to cyber, EMP, geomagnetic disturbance and physical attack threats. The FAST Act also noted

the critical nature of large power transformers and requires a feasibility study of a strategic transformer reserve which we will complete by the end of the year.

President Policy Directive 21 identifies DOE as the sector-specific agency for energy infrastructure. As that, we serve as the day to day federal interface for the prioritization and coordination of activities to strengthen the security and resilience of critical energy infrastructure.

In addition, we serve as the lead agency for Emergency Support Function 12 under the national preparedness systems, the national response framework. So we are responsible for facilitating recovery from disruptions to the energy infrastructure.

We look forward to working with Congress now on the alignment of authorities, responsibilities, resources and organization.

In conclusion, it is clear that energy security has many dimensions, from global market structures to the low-carbon energy system, transformation to resilient infrastructure and response to a changing threat environment.

Vice Chairman Olson, Ranking Member Rush, Ranking Member Pallone, members of the committee, I look forward to continuing to work with the committee and to setting the stage for the next administration and beyond. I look forward to our discussion.

Thank you, sir.

[The prepared statement of the Honorable Ernest Moniz follows:]

**********INSERT**********

Mr. Olson. Thank you, sir, and we will begin the questions with myself -- five minutes for questions.

Okay. Last year, Congress enacted the Bipartisan Budget Act and the FAST Act, as you mentioned. They have provisions to modernize the Strategic Petroleum Reserve -- the SPR -- and improve its emergency response capability.

One of the requirements was for DOE to complete a long-term strategic review and report to Congress. That report is out, as you mentioned.

It raised some serious questions about the ability of the SPR to meet its mission. My first question is how much oil are we supposed to have if we have to draw down from the SPR if we have an emergency?

Secretary Moniz. The -- I mean, the designed draw down rate is just over 4 million barrels a day.

Mr. Olson. What Is the actual draw down rate?

Secretary Moniz. Well, that depends very much on the specific circumstances but, of course, the whole point of the modernization of the SPRO is to improve our distributional capability, which has been compromised, actually ironically, by the very increase in production that we have seen in oil.

Mr. Olson. But your reports show the actual draw down is more than 2 million barrels per day below the designed draw down

rate of 4.4 million barrels per day. Are you concerned by this?

Secretary Moniz. Again, we are going to increase that with the project that the Congress has authorized and we've submitted our appropriation request for the first tranche.

And if I may just add, Mr. Chairman, that it is urgent that that be approved because the authorization was only for four years. So we really need to get on with the project.

Mr. Olson. How do you suggest to meet the mission to make sure the SPR is viable? How should we do that? Any ideas?

Secretary Moniz. To make sure it is what? Well --

Mr. Olson. Yes, sir. To prove its ability. To prove its ability.

Secretary Moniz. It's modernization and it is building new marine distribution infrastructure in the Gulf region.

Mr. Olson. Details. Great. The second line of questioning, both the House and Senate have passed bipartisan legislation to streamline a process for LNG exports and there's more than one legislative option to push that across the finish line.

The House would like to see it included in the defense spending bill. It is also under consideration in the Energy Conference. Do you agree that LNG exports offer wide-ranging benefits to the economy, energy security and maybe even the

climate?

Secretary Moniz. The national interest determination that we make is precisely to answer those questions and so far we have approved and, frankly, since our change of the process in 2014 we have approved quite speedily every application that is ready for action.

The idea that we are somehow dragging this out is simply incorrect. The national interest determination requires us to get the appropriate information including, for example, FERC's action.

So right now we have acted on all of the applications and, frankly, up to now we've approved them all. So and we've approved them -- since our streamlining of the process in 2014 we have approved them as short as one day after having the FERC action to a few weeks.

Mr. Olson. Let us choose that one day all the time. That sounds like a benchmark we should over and over and over --

Secretary Moniz. I think one day all the time would be stretching credulity since there are questions that we have to answer. But we are -- we have been committed to expeditiously addressing these applications.

Mr. Olson. Thank you. My final question is what areas of the federal emergency permitting process need the most

improvement? Why does it seem to take longer to permit midstream energy infrastructure like pipelines than it does to pass, site and approve a drilling rig and also power stations?

How come they are different than pipelines? How come upstream is different than downstream and midstream? Also for the energy permitting process?

Secretary Moniz. Well, I think of energy infrastructure as a whole. I mean, the Congress has, frankly, distributed responsibility for different elements of infrastructure among multiple agencies.

DOE has some responsibility. The EPA has some. Department of Transportation has some. Department of State has some. Those particular issues that you raise certainly are not in the Department of Energy's bailiwick.

Mr. Olson. Should they be? Should they be in your bailiwick? Can you take -- you would be the big king of the jungle, so to speak?

Secretary Moniz. I think -- I think that would be an interesting discussion between the Congress and the administration.

Mr. Olson. Thank you. That's the end of my questions. I now yield to the ranking member, to Mr. Pallone, ranking member of the full committee for his five minutes of questions.

Mr. Pallone. Thank you, Mr. Chairman.

Mr. Secretary, I wanted to ask you some questions on LNG particularly related to language in the energy bill on LNG exports that is concerning me.

As you know, applications for LNG export have been increasing in recent years. So since revising the approval process for LNG applications in 2014, DOE has been able to quickly approve applications after FERC completes their review. Is that correct?

Secretary Moniz. Yes, it is.

Mr. Pallone. And typically, how long does it take DOE to turn these applications around?

Secretary Moniz. As I said, it has been between a day and a few weeks since 2014.

Mr. Pallone. Now, the Energy Conference is considering two provisions that would require DOE to approve an application for export within 30 days of FERC publishing the final EIS.

Proponents argue this deadline is necessary to ensure timely consideration by DOE. But given the department's track record, I find this arbitrary deadline to be completely unnecessary. In fact, it could be detrimental to the ultimate approval of an expert application.

In light of recent events related to the Jordan Cove application in Oregon, do you believe it makes sense to force DOE

to hastily make a decision on an application based on the final EIS?

Secretary Moniz. We have consistently said that we see no need -- no need for this by performance and as you've said, I think, very correctly, there can be unintended consequences, in fact, which can go in the opposite direction.

The Jordan Cove -- when that was rejected by FERC for non-environmental reasons it would have caused a problem with the bills as proposed.

So, you know, we really should be having records of decision by the -- by FERC in this case or MARAD for an offshore facility because that is the complete set of information that informs our final judgment.

Mr. Pallone. Thank you.

Now, I wanted to ask you about climate change and note that climate change has to play -- or is significant in terms of energy security.

By lessening our reliance on fossil fuels and reducing our carbon emissions we can make our energy future more secure and you recognize this in your testimony when you reference the vulnerability of our energy systems to climate change.

So my question is can you talk a bit more about the impacts climate change is having on our energy security and what can be

done to address this important issue?

Secretary Moniz. Climate change -- first of all, we have seen just this week that a number of military leaders have pointed out how climate change is a risk to our national security writ broadly, which has, of course, energy security implications as well.

Then there are the issues around rising sea levels and weather, et cetera. But, of course, the threats of energy security ultimately come to fossil fuel supply since we all have our own solar supply, et cetera, et cetera.

So, clearly, we need to, as we go into a low-carbon transition we are addressing energy security but in the near to midterm we are also going to have to increase our approach to resilience of infrastructure because among the many threats the threats associated with climate change to our infrastructure are just growing and they will grow further. So that's where we need to harden our infrastructures.

We also need to improve our response to the inevitable disruptions that we have been seeing -- flooding, obviously, in the southeast is an enormous issue -- for example, wildfires in the West, droughts in the Southwest and California.

We can go on and on with these regional impacts. So it is -- we need to really think about addressing our security and our

climate issues in an integrative way.

Mr. Pallone. Thank you. I am going to try to get one more question here and that is about the electricity grid.

In your testimony you discuss modernizing our country's energy infrastructure. We have an electricity grid that represents the energy mix of the 20th century and not the present, more dynamic state in which we currently exist.

So in your view, what parts of our energy infrastructure are currently the most vulnerable and in need of attention.

Secretary Moniz. Well, I think it is many parts including, as you mentioned, our old natural gas pipelines is a major safety and environmental problem.

But I would just focus my comments on electricity because, as we know, kind of electricity is the grid that all the other infrastructures depend upon as well.

There, we have many tasks at hand. One is we have to better be able to integrate resources that are distributed and I think there is a lot of consumer and customer interest in more distributed generation. But that does not fit the traditional model of how electricity is delivered.

So we have both technical and regulatory issues. But I would say one very big overarching issue is that we need to really get on with the job, in my view, of a much more complete integration

of information technologies into the grid both to provide reliability and resilience but also to integrate that with providing new consumer services.

So it is really an end to end kind of utilization of information technology. I think we are just scratching the surface right now.

Mr. Pallone. Thank you. Thank you, Mr. Chairman.

Mr. Olson. Gentleman's time has expired.

The chair recognizes the head of the full committee, Mr. Upton, for five minutes.

Mr. Upton. Thank you, Mr. Chairman.

Mr. Secretary, welcome back. It's good to see you. I appreciate the relationship that we have had all these different years.

I want to go back to some of the questions as it relates to SPRO, and if you're not able to answer, something in writing afterwards will be certainly sufficient.

You know, some would argue that SPRO should, you know, now be eliminated or somewhat phased down. It's a relative of the 1970s era when we were subject to the Arab embargo.

I point out that, of course, domestic energy production is up and imports are down. Private domestic oil stockpiles are at record levels and, of course, we are able to export crude for

almost a year now and, in fact, we see that happening.

And there is more than or there is almost a billion and a half barrels of crude oil petroleum products in private storage so they ask do we really need a government-owned stockpile.

Now, are we actually required to hold public stocks of oil to meet international agreements and how do other countries do it?

Secretary Moniz. Well, first of all, of course, maybe it is worth saying that we are still importers of about 7 million barrels a day of crude oil. So we have very major importers. We are now net exporters of oil products but a lot of crude oil imports.

The -- we are required by our agreements in the -- with the International Energy Agency formed in the 1970s not only to hold strategic reserves but also to have a particular share, which is about 44 percent, of the collective response capability of the OECD.

Mr. Upton. Is there a mix that's required in terms of public and private supplies or not?

Secretary Moniz. It's done differently in different countries. We do it by, obviously, having a physical reserve with four locations. Some other countries do it by requiring reserves with distributors, for example. So there are different ways but

always has to be on call that amount of oil.

I would say that and just -- we can go into more detail but as you opened up your question do we -- kind of do we need a petroleum reserve, I think most vociferously I would answer yes and, again, that's very --

Mr. Upton. I knew that answer which is why I didn't define it.

Secretary Moniz. Right. But the -- but again, the issue is, as I said in my opening remarks, is that we cannot become complacent because we are producing more oil because we are and we will remain linked to the global oil price and our economy is exposed to that and this is a very, very important tool. It's our premier energy security tool.

Mr. Upton. Let me go a little bit into the maintenance. As you know, in the DOE IG report more than 70 percent of SPRO's equipment and infrastructure exceeded its serviceable life.

The report identified five separate major equipment failures in the last couple years. I know that we authorized $2 billion for SPRO modernization, which was intended to go to needed repairs and upgrades.

Is there a focus on major maintenance in the backlog of the repairs?

Secretary Moniz. Yes. So we estimate and we will be

seeking -- well, we've already asked for the first appropriation.

Mr. Upton. Right.

Secretary Moniz. We seek $800 million, roughly, for the modernization and the upgrading of the equipment and another billion, roughly, for enhancing the marine distribution capability, which we really need now because of the new oil flow patterns with shale oil.

Mr. Upton. And if that money came through how long would it take to complete the work?

Secretary Moniz. It would be a few years and in fact the authorization that you all provided was for four years. So we need to get on with that now and it should be finished within I think around three years.

Mr. Upton. Thank you. Yield back.

Mr. Olson. The chairman yields back. The chair recognizes the gentleman -- the chair -- ranking member of the subcommittee, Mr. Rush, from Illinois for five minutes.

Mr. Rush. I want to thank you, Mr. Chairman.

Mr. Secretary, it is always good to see you and welcome back to the committee and during these waning days of the Obama administration I want you to know that to some of us you will always be our rock star superstar secretary and we --

Secretary Moniz. For 128 more days.

Mr. Rush. Mr. Secretary, it is been indeed a pleasure working with you to establish the critically important Minorities in Energy Initiative in DOE and sometime before those 128 days are up I would like to sit down with you and look at the progress and what needs to be done and what we've accomplished so far in this particular area.

So my staff will be in contact with appropriate people in order for us to arrange that meeting.

Secretary Moniz. That would be a pleasure and particularly if we could help to set up the transition to the next administration to continue that work.

Mr. Rush. I look forward to it.

Mr. Secretary, in the energy bill -- in the House bill there is a provision that would have delayed any action on new efficiency standards for furnaces until after the department had issued a supplemental notice of proposed rulemaking.

This was a provision that Chairman Whitfield and I put together by arranging all the energy stakeholders and all the efficiency community stakeholders in a room together and having them negotiate directly with each other until a consensus was reached. To the best of my knowledge, everyone on both sides of the aisle supported that provision.

However, a little less than two weeks ago your department

actually issued and that stated supplemental notice of proposed rulemaking.

To my mind, Mr. Secretary, you met the bar that we and, more importantly, the stakeholders set for you in the House bill as a condition for moving forward with the first new furnace efficiency standards in almost -- in around 15 years.

Now as we are in conference on the House and Senate energy patent we have proposed that the House provision as well as a similar provision in the Senate bill be dropped because once again, Mr. Secretary, and I emphasize you met the bar that we set for you.

Do you agree that we should let your department move forward on the standards now that you have done what we asked? And then some of the stakeholders are unhappy and have threatened to take this to the courts.

Should we even let the courts handle this at the American Gas Association publically propose or let you and your department attempt to respond to these concerns? Isn't it in your court and shouldn't it be in your court right now?

Secretary Moniz. Yes, Congressman Rush, I completely agree with you that I think, you know, the process -- this process has worked well for all kinds of efficiency standards.

We go through the process. We listen, which is why, as you

said, we heard the input of industry, acknowledged that there was some issues raised. That's why we went back with the SNOPR, which did establish a new class of small furnaces, addressed, certainly, perhaps not all but some, certainly, of the industry's concerns.

So this is working. We are now absorbing their comments on the SNOPR and we would look to try to get a final rule out actually this year.

So the process is working and I think there's a slippery slope if one starts to have the process interfered with for very specific rulemakings and because we do have a successful process that we are executing expeditiously. Thank you.

Mr. Rush. Thank you. Mr. Chairman, I yield back.

Mr. Olson. Gentleman yields back. The chair recognizes a fellow Texan, chairman emeritus of the full committee, Chairman Joe Barton for five minutes.

Mr. Barton. Thank you, Mr. Chairman. I appreciate that.

Welcome, Mr. Secretary. We got a few folks in the audience. Congressman Gingrey, glad to have you back, sir -- former member of the committee and I think the subcommittee -- and Mr. Bud Albright, who's former chief of staff of the committee. Glad to have you.

I can't think of the last time, Mr. Secretary, we had a Cabinet secretary volunteer to testify. I am told that you wanted

to be here. Usually, we got to drag you guys kicking and screaming and threatening and all kinds of stuff.

Secretary Moniz. This is -- it is an important discussion.

Mr. Barton. And so you just said hey, I want to come by and visit and we dropped everything we were doing so we could hear you. We appreciate that.

You mentioned in your opening statement the Strategic Petroleum Reserve and the FAST Act and the review of the function. You all put out a report, as you pointed out, a month or two ago.

That report is a little bit hazy on details. I've had a few inquiries in my office about do you -- when do you plan to put out, perhaps hopefully, for competitive bids some of the big projects -- the Life Extension project, the Maritime Terminal Enhancement.

Are you going to competitively bid those and if so do you have a timetable for when those requests for bids might go out?

Secretary Moniz. Yes. Well, we have -- of course, we need to have the appropriation before we can go out and so we have our first request in for the first appropriation, which would be focused on the -- principally on the modernization part. But just last --

Mr. Barton. So the next year or so?

Secretary Moniz. Oh, no, sir. Early in the next year.

We'd like to move out early in the next year and, again, with only four years of authorization we need to, you know, kind of be pretty snappy in terms of moving this all forward.

But the --

Mr. Barton. Snappy is a technical term that you learned?

Secretary Moniz. Yes. That's right. The -- we have this under our formal project management system. The first milestone for the modernization was done last year.

So we are ready to go. The first milestone for the marine terminal distribution only just happened last month. So that project will kind of be second in line but we will be starting the conceptual engineering in the next year.

Mr. Barton. You answered a question to Chairman Upton that -- how important the Strategic Petroleum Reserve is and that it still is relevant. But you also answered his question that other countries do it differently.

You know, when we passed the ban -- to repeal the ban on crude oil exports we also put in a provision to do a study of the SPR.

I think it would be worthwhile to look at privatizing. I mean, you mentioned in an answer to Chairman Upton's question you're going to need about almost $2 billion to modernize it.

It would seem that now would be a good time to maybe take a page out of the play book of the Europeans and look at privatizing

the SPR so that the government is not on the hook for the maintenance and the modernization. Any interest in doing that and while you're moving forward also look at privatizing?

Secretary Moniz. Well, we can certainly make the next team aware of that possibility.

Mr. Barton. You may be part of the next team, you know. You know, you're sitting there smiling and volunteering. If Mr. Trump is the president he may just ask you to stick around for a while.

Secretary Moniz. We could discuss that.

Mr. Barton. Yes. I am about to run out of time here. You know, the folks in Chicago just have an attitude. That's all there is to it.

What's your view of the market for crude oil exports now that we have repealed that ban and we are exporting crude oil and we did it in a way that we really set up a market.

There is not a lot of bells and whistles in terms of government oversight or interference or anything. I think it is doing very well and I am very happy that we have brought balance to the world oil markets by repealing the ability of our domestic producers to export. Do you have any views on that?

Secretary Moniz. Well, I think I would in many ways just repeat what I said last year in the discussion because I believe

it is being played out.

Certainly, the amount of exports -- the increase in the amount of exports has been very, very modest -- about 10 percent -- because we -- of course, we used to export to Canada but and that's because in the context that we still import 7 million barrels.

But, of course, what's happened is that there are customers who really want the light sweet oil coming out of the shale and so I think that's probably -- there's been some optimization of refinery operations in various countries by getting some of our light sweet oil.

It's had some ironic changes and also, for example, I recently visited the biggest East coast refinery in Philadelphia and they -- at one point, they were taking 20 percent of the Bakken crude and shut off their imports from Africa and now that's flipped. They're back to three-quarters African imports as the market has kind of readjusted.

But macro, as I expected, frankly, at least for some years I don't see an enormous increase in the exports and that's shown because especially the Louisiana Light Index has actually been trading even above Brent. So the idea -- so there's not a big price differential to work with.

Mr. Barton. Right. Well, that's the whole point of a

market. As you know as secretary is you let them actually operate and that is in itself a tremendous achievement and over time I think it is going to bring benefits to the producers and to the -- and to the consumer.

My time is expired. I simply want to say thank you for your service to the country. You've always been available to the members of the committee. You've always been cordial. Our differences have been on policy, not on personality. I think you've served your country well as secretary.

Secretary Moniz. Thank you.

Mr. Barton. And I wish you the best in whatever the future may hold for you.

Secretary Moniz. Thank you very much.

Mr. Barton. With that, I yield back, Mr. Chairman.

Mr. Olson. Gentleman's time has expired.

The chair recognizes the gentleman from California, Mr. McNerney, for five minutes.

Mr. McNerney. Well, again, I thank the chair.

Mr. Secretary, as more renewable come onto the grid and as localized generation increases, what future do you see for the transmission as a business, going forward -- for electrical transmission?

Secretary Moniz. Well, the -- clearly, one of the important

issues is the ability to integrate large sources, wind and solar, typically from potentially over large distances. And as we know, there is difficulty in the siting and building of these long-distance high-voltage lines.

We did use the congressional authorities given to the Department of Energy earlier this year to approve one such project that crosses several state borders.

It's sufficient, probably, to say that is now in litigation. But it is very important if we are going to be able to really maximize our system for the 21st century.

We need everything from the very long-distance transmission to distributed generation and bringing all of those things together is going to require grid and storage solutions.

Mr. Barton. Well, following up with that question, what do you see the business models looking like for the large utilities as we get more distributed generation?

Secretary Moniz. Well, I think that there's, clearly, a bit of a challenge in terms of how these business models evolve. The -- and it is not just distributed generation.

Distributed generation is a very important part of that. But I would just also note that, you know, our success in demand side management is also a challenge to traditional business models because particularly when the pie is getting bigger, when the

market is getting bigger, there is many more ways of bringing in new players. So there is that kind of system.

And finally, I think the -- well, not finally but one other factor is that the regulatory structures, clearly, largely in many ways state-based, certainly on the distribution side, clearly, but the issue of how to value all the new pieces in the grid like storage, like capacity value, like low-carbon value, et cetera, we really have not yet managed to solve that problem.

And so valuation, which will open up new business models, will be extremely important and that is a focus of our quadrennial energy review work right now that we hope to get out in December or so.

Mr. McNerney. Good. Well, water is an essential component to energy security. Can you elaborate on DOE's water energy technology team? How are they addressing that issue -- the water-energy nexus in security?

Secretary Moniz. Yes. We have a very -- now for the last two years we have been ramping up this water-energy nexus work and there is several elements there.

One, by the way, that we are focused on besides new technologies and we have proposed, by the way, in our fiscal year 2017 budget a new kind of, roughly, $25 million a year hub around water. It's called desal but it is not just about the membranes.

It's about the system and how you clean up the water and everything else. So that's a focus.

But in addition, I would just note that from our perspective we think the quality and comprehensiveness of data on water is not up to where it needs to be, certainly in terms of publicly available databases.

So I think this issue of working data, working on technology and working on the systems issues are all critical.

Mr. McNerney. Very good.

Secretary Moniz. And I might add -- if I may add one more thing that international partners are really excited about working with us on this, and certainly Israel, which is so far advanced in these technologies is one that we are building up a stronger collaboration on.

Mr. McNerney. And could you briefly talk about the energy storage program at the department?

Secretary Moniz. The energy storage program is also one that we have expanded -- a lot of congressional interest in that and support, which we appreciate. So we are working -- we have a battery hub, which is doing extremely well. It is centered at Argonne. Berkeley is the major partner. So that's going on.

And I might just add we recently put out -- maybe a month ago -- a report on hydro and pointed out that in terms of storage

we still have a lot of capacity for pumped hydro in the country, which today is the most cost effective in the places where you can do it.

Mr. McNerney. Thank you. Mr. Chairman, yield back.

Mr. Olson. Gentleman yields back.

The chair recognizes the gentleman from Ohio, Mr. Latta, for five minutes.

Mr. Latta. I thank the chairman very much and, Mr. Secretary, thanks for being with us today. It's good to see you again.

And I would like to touch on a couple of areas that you brought up in your testimony, one being fixing America's surface transportation under the FAST Act, and under the FAST Act provides that DOE, with a new authority to protect and restore critical infrastructure when the president declares a grid security emergency.

How has this new authority changed the way DOE works with the private sector to protect and restore critical infrastructure?

Secretary Moniz. So we are -- we are really ramping up that intersection. In fact, our deputy secretary just hosted a meeting with leaders from the electricity sector last week at our Sandia laboratory.

We have -- and in fact if I just mention, say, cyber security as an example of that, we have developed now with the private sector CEOs -- well, CEOs and people who work for the CEOs -- a number of tools.

Partly, it is something called CRISP, and I've forgotten what the acronym stands for, but it is a program of much more bidirectional exchange and situational awareness about cyber threats including the exchange of classified information.

Secondly, we have developed what's called a maturity model which allows the electricity sector but also we've extended it to the oil and gas sectors to get a much better understanding of where they are in their cyber capabilities. And third, we have just instituted in August a DOE -- an integrated joint cyber activity that knits together all of our capabilities from our laboratories on cyber to get faster response -- for a faster identification and response to cyber threats. That's already shown its potential in a particular cyber threat that was identified much faster than was done in the industry itself.

Mr. Latta. You know, since you brought up on the cyber side and especially what's happening there, how's your cooperation then working with other departments and agencies in the government, especially Homeland Security?

Secretary Moniz. I think it is been -- I think it is been

good and getting better. In fact, these -- this information sharing CRISP initiative is with DHS and certainly we also work, I might say, not in electricity so much -- well, it is electricity too but it is other areas -- we work extremely well with FEMA in terms of addressing issues that included some of the flooding issues recently, for example.

Mr. Latta. Okay. And the FAST Act also requires you to submit a plan to Congress by the end of the year evaluating the feasibility of establishing a strategic transformer reserve for the storage of spare or large power transformers in emergency mobile substations to temporarily replace critically damaged equipment.

Could you tell me tell me what the status of the review is and when you would be able to complete that?

Secretary Moniz. We expect to meet that December target. We are well along in that.

Mr. Latta. Okay. And one other thing, if I could, because it is one of the areas I am always interested in. In your testimony -- you also brought it up in our opening statement that when you were talking about different threats that are out there, either natural or manmade, where are we at on especially DOE and trying to combat electromagnetic pulses, especially when they are manmade?

Secretary Moniz. We have done quite a bit of work on that in collaboration with EPRI. In fact, this is part of a report that we'd be happy to share with you if you get a chance --

Mr. Latta. Yes, I'd like to get that.

Secretary Moniz. -- on resilient strategy. That was done with EPRI. We also have, of course, classified information that could be discussed in a different venue.

Mr. Latta. Right. Well, thank you very much, Mr. Secretary.

Mr. Chairman, I am going to yield back the balance of my time.

Mr. Olson. Gentleman yields back. The chair now is happy to recognize the University of Houston's biggest fan in Florida, Ms. Castor, for five minutes.

Ms. Castor. Well, thank you, Mr. Chairman. He says that because the university president used to be the provost at the University of South Florida campus. So we take ownership of her, too.

But I want to thank you. At the University of South Florida in June at the Patel Center for Global Sustainability, Dr. Lidija Sekaric, your director of the Office of Solar Technologies, came to give a presentation and the room was packed even though we were in the midst of a huge rain event due to a tropical storm.

And I think you're absolutely correct that American families

and businesses across the country have so much interest in the growing renewable marked and the potential to save money through energy efficiency.

In fact, at the end of August during the primary election we had a constitutional amendment on the ballot to provide a little help to solar industry and it passed by 73 percent.

And I think folks are frustrated in the Sunshine State because we have no goals for renewable portfolio standards and they even cut back on energy efficiency.

So what you say about the business models at the state level really hit home and we can talk a little bit more about that.

But the Energy Information Administration is projecting that growth in renewable energy is going to grow faster than just about any other energy sector and in fact over the -- they say over the past year we've exceeded projections month after month after month.

You've said, in this QER right now, that it is outdated -- that we've got to look beyond oil security and energy security needs to be more broadly defined to cover not only oil but other sources.

Combating climate change is also essential to strengthening collective energy security. How far behind are we? What -- I know the big grid modernization effort is very important but what

else do we need to be focused on?

Secretary Moniz. Well, I think the -- first of all, in terms of the -- addressing the clean energy part, which was, like, the third, fourth and fifth principles, there the major initiative that we put forward is the idea of doubling our innovation budgets over, say, a five-year period and we've been pleased that the concept has gotten, I think, very strong bipartisan support. That's got to get translated into numbers over these -- over these years.

But I think that's very important. I might also add, and it'll probably be referred to soon by Mr. McKinley, that I was in Morgantown earlier this week for our thirteenth regional innovation meeting because we are emphasizing that we think regional portfolio management actually will be a real plus and I am pleased to say there's been a lot of support for that, too. Now we need Congress to hopefully authorize that.

So that is on that side. But in terms of the more global aspects of energy security, I think since 2014 when those principles were put out we had made substantial progress, particularly in our discussions with the EU -- with the European Commission.

The European Commission then adopted a very strong energy security policy in line with those principles and we are very --

work closely with them.

There is still a lot of implementation to go in the European context. But that's been important and I might say a lot of it was driven initially by the Ukraine aggression.

Ms. Castor. I think that's right because what I hear back home they think the clean energy future will involve a lot of job creation so that investment in innovative technology is very important.

They think it is -- they know it is going to save them money as they take control of distributed energy or even right at their thermostat in their home and climate change -- they see the cost right now after this recent tropical storm. They understand. We have salt water intrusion.

These huge rain events are costing people money -- flood insurance, emergency response -- and if we don't do more up front it is going to be very, very costly and they understand that.

Secretary Moniz. And if I may say, I visited Florida Power and Light and, yeah, they are doing a lot but it costs money to harden the system because of the obvious risk to sea level rise, et cetera.

Ms. Castor. Thank you.

Mr. Olson. The gentlelady yields back and, Mr. Secretary, ask and you shall receive. We recognize the gentleman from West

Virginia, Mr. McKinley, for five minutes.

Mr. McKinley. Thank you, Mr. Chairman, and thank you again, Mr. Secretary, for coming to West Virginia to participate in that panel and also the trip to Longview power plant that was -- I hope it was beneficial to you.

I have got a couple comments. I want to build up a bit of what my friend from California was talking about because when I read the -- your written statements and listened to your opening statement there were two omissions that I heard.

One was you didn't talk about water as being part of our national and economic security for this country, which I thought was made. But even more, so you didn't mention coal, other than the fact that gas is going to supplant coal perhaps in the near to long-term future.

So just getting past that, that's -- we are just going to have a disagreement. I think it deserved to have some mention as part of our national economic security of this country on that.

But let me go to some questions, however quickly. We've had testimony from Phil Moeller when he was back with FERC and he has since confirmed again that we have apparently -- talking about grid security and reliability that we have lost apparently somewhere in the neighborhood of 70 gigawatts of coal-fired power plants around the country and we've been replacing them with gas

and renewables but more, from what I understand, with renewables so it's an intermittent load. It's not base load.

We're getting similar -- we are still at a net loss but much of that gain that we've made that replacement is over in renewables, which we can't count on because of their intermittent use with it.

So how do we -- how can FERC -- how can Congress get involved in valuing just dependable base load power plants, whether that's using gas or coal? What do we do to incentivize that so we've got a satisfactory grid?

Because we know there's a fair -- we know we can't count on wind and solar to power our base load.

Secretary Moniz. Well, okay. So the -- of course, at the current levels of penetration in effect the grid is the storage system for wind and solar.

Now, as those penetrations -- if they get much, much higher, of course, then we will have to manage the variability of those sources.

Now, part of it can be, of course, technology like storage. Energy storage would take care of that. But your suggestion I think goes right to something I mentioned earlier and that is what is the way of valuing different services in the grid that have not been part of the traditional regulated utility model?

And one of those would be this question of value of base load which, by the way, of course, right now that's a major issue as well with nuclear with the shutdown of a number of nuclear plants as well.

And so in terms of response, the -- currently I would say that there are certainly very few authorities in the federal government, certainly at DOE.

FERC is doing work on what they call price formation, which is a question of how do you value these other qualities, and states are the center of the action.

Mr. McKinley. Thank you. I'd like to follow up more with you. Maybe we can have more of a conversation about that so that we can have more to battle with.

But you also talked about that energy storage and part of the House package and also in the Senate package -- the energy bill -- there is the ethane storage and what we refer to as the Appalachian hub so that we would be able to have storage of ethane not only on the Gulf coast but someplace in the northeast.

Are you aware of that and do you see an advantage of having a -- for energy security and national security having a separate ethane storage facility?

Secretary Moniz. I have to be honest, I haven't really thought that through. So I really would like to think about that

and get back to you.

But I would say that, of course, the -- and, as we know, in Pennsylvania, West Virginia, Ohio there's a tremendous opportunity given all the ethane production for building on industry and so it is an extremely valuable commodity.

So but, again, specifically on the issue of ethane storage I have to admit I have not -- I have not thought that through.

Mr. McKinley. Just in the remaining time I have, just quickly. When you met with Longview and they made the statement that they are the most efficient and cleanest coal-fired power plant in America ahead of Turk but yet they've said they can't get a permit to build a second facility to build off that. What would we learn -- what did you learn at how we could help another facility like that be constructed?

Secretary Moniz. Well, again, as we discussed in Morgantown, the -- first of all, we continue to be very committed to carbon capture sequestration as a critical technology that we will need and the IEA says that and everyone else says that, that we will need to meet our climate goals most economically. So that's very important.

I thought the proposal that they made there about a, you know, kind of like a 50 percent coal-firing was quite interesting and in fact I hope I do get a -- kind of a spreadsheet on that to look

at, meeting the clean power plant goals with the coal and gas coal-firing will be quite interesting.

So I am -- again, I am happy to discuss it. Oh, and a third one, which I mentioned as a big game changer if we can really solve it but it is probably longer term is the question of what are the technologies for economic very, very large-scale utilization of CO2.

Mr. McKinley. Thank you.

Secretary Moniz. That's a big deal if we can -- if we can solve that problem.

Mr. Olson. Gentleman's time has expired.

The chair now recognizes the number-one fan of the Houston Cougars from Houston, Mr. Green, for five minutes.

Mr. Green. Thank you, Mr. Chairman.

Welcome, Mr. Secretary. It's good to see you again and I know we -- each of us have worn different hats over the years and I appreciate the job you're doing.

Let me start out on the Strategic Petroleum Reserve. We import now 7 million barrels a day. How long would it take if all of a sudden we had an embargo and we couldn't ramp up in our own domestic production, which I think we could, to be able to draw anything out of the SPRO?

Secretary Moniz. Well, we could certainly start

withdrawing from the SPRO. I think it is in a week time frame, something like that.

Mr. Green. Okay.

Secretary Moniz. So it is a rapid reaction. Whereas going to the uncompleted wells would be a several month activity.

Mr. Green. Because I was told it was much longer than that because and that's why some of the things we did --

Secretary Moniz. I will check on that. But I believe -- I believe it is more like a week. It's not so much a technical as it is getting all of the -- sometimes all of the bids required for the distribution of the oil.

Mr. Green. Yes. Because even though we have a great pipeline accessing Louisiana and Texas, like you said, the bare time issues that we have to actually get it --

Secretary Moniz. Yes, because -- also because of reverse flows in some of those pipes to get incremental barrels out is probably going to require, as we said, much more maritime distribution.

Mr. Green. Okay. Well, the main questions I have, and you talked a little bit about it is that in 2014 one-third of the intentional cyber attacks targeted energy infrastructure.

In your testimony speaking about cyber security you stated we are seeing threats continuing to increase in numbers and

sophistication. This evolution has profound impacts on the security and resilience of our energy sector.

I hope in our hearing today we can understand what's being done and on what more we can do in Congress to protect from these increasing hazards.

Of course, it is not just, you know, Russians looking at Democrat or Republican. You know, but we are talking about refineries in East Harris County and Louisiana -- you know, coal plants, natural gas facilities and things like that.

What are the most significant challenge in securing energy delivery systems against the cyber attacks?

Secretary Moniz. I would just add, if I may, the point you make about the interconnectedness I think is very important and as we've pointed out that electricity problems have led to enormous refinery and fuels problems, et cetera, et cetera.

So it is really important and cyber is just a growing threat. So I think the key is, as I said earlier, working with industry is -- I mean, at DOE, let me emphasize, we have, I would say, three different kinds of cyber challenges.

One is the -- a standard big entity, you know, administrative systems and personal information. A second is our nuclear weapons information and third, and the hardest one in many ways, is working with the private sector on the energy system.

So it is really information exchange including making technology available to the private sector is really a key in many ways. A second key for us is to use all of our assets including those at our laboratories and bring those to the table on cyber threats, and we've done enterprise wide.

The one thing that I would say is in terms of possible changes and maybe legislative is -- and it is not only for cyber, it is for other issues as well -- is that we need to make sure that there are not barriers which could be competitiveness barriers, for example, that are out there for different parts of the industry working together on the response.

Mr. Green. Well, I will give you -- close with one example. When we had Hurricane Ike come through East Harris County and it shut down the refineries in Galveston Bay and both United Airlines who said we'd never lighter planes out of Houston and we are having to do it and the Air Force was there too, saying -- and the Navy because we needed to have this jet fuel and so that's why we need that -- you know, the grid up.

Secretary Moniz. Coordination.

Mr. Green. The plan has -- each plan has their own but you can't run a plant on generators. You have to have the grid to help and so that's why it is so important.

And I know in some areas in East -- like in East Harris County

we have a partnership both for security and other things. But I just want to make sure that everybody is on the same page.

Secretary Moniz. Yes. The coordination is important. I might add that, for example, in May we ran a very big so-called tabletop exercise in the northwest and lots of industry participation, many agencies, so that everybody could understand the challenges of everybody working together on the same page. So that's important.

Another thing I'll just mention is that, because the SPRO was mentioned, is that even though it is much smaller, you know, we have moved out in a couple of product reserves as opposed to crude oil reserves and that came into play in Sandy when we released that to some of the first responders so that they would have the fuel to respond.

Mr. Green. Yes, the diesel and everything else.

Secretary Moniz. And so that's another interesting discussion.

Mr. Green. Thank you, Mr. Chairman.

Mr. Olson. Gentleman yields back.

The chair now recognizes the gentleman from the Commonwealth, Mr. Griffith, for five minutes.

Mr. Griffith. Thank you very much, Mr. Secretary. Thank you for being here as well.

The last time you were before this committee back in March I expressed my appreciation for the folks at Department of Energy working with me to set up a visit to my district to discuss the future of coal.

About a month later, David Mohler, DOE's deputy for clean coal and carbon management, came down to our coal field region for a round table discussion with community leaders. A public symposium at the University of Virginia's College at Wise was held on the future of coal technology, innovation in industry.

And I'll also highlight after we did that with all the opinion shapers and the business leaders and the folks who work in the coal industry your team went over to Clintwood, which doesn't get many visitors -- there's no four-lane highways in Dickinson County -- to visit students at Ridgeview High School, which is a brand new high school built with a lot of dollars from the federal government because the county is not wealthy. It is central Appalachia and the coal fields, mountains, trees and lots of good people and not a whole lot else.

That visit was particularly important for the students there in Dickinson County because your team made it clear that there are possibilities in science that can affect the coal industry positively. It was just a great visit and I commend your folks for doing that.

I also commend you for having the leadership to have folks -- I heard you talking about with some of the other folks visits that had been made by yourself and members of your team in other districts as well.

I think that speaks highly of the work that you're doing. And while we may not always agree --

Secretary Moniz. Thank you.

Mr. Griffith. -- I think we are headed -- with your leadership at the Department of Energy we are headed in a better direction and I appreciate that.

Secretary Moniz. May I say, Congressman --

Mr. Griffith. Please.

Secretary Moniz. -- that because maybe it is been provided to you but just to make sure -- actually at the end of August we produced I think a very nice synthetic paper on all of the coal issues that we are dealing with and if you not seen that we'll shoot it to your office.

Mr. Griffith. I haven't seen it but my staff may have it and it is been one of those busy times in D.C., as you know, when have a few weeks. But I'll try to read that when I get home.

Secretary Moniz. Okay.

Mr. Griffith. But we had a lot of good discussions and we talked about a lot of different things on how we can get our coal

miners back to work, how we can find a continued future in the coal region and our economy and in our electric generation fleet.

It meant a lot to the people of southwest Virginia and particularly in the coal fields in those counties. So I appreciate the hard work that you did in making all that happen.

Now, one of the main things that I found particularly interesting in our discussions is we talked about the need for research parity for clean coal technology, and while you've touched today already on some of the things with carbon capture and sequestration, I think that's the hot button issue and probably a good source in the short run. But with research I am convinced we can use our fossil fuels -- not just coal but the other fossil fuels as well in better ways.

Can you just take a minute and discuss some of the things you all are working on with all of the different fossil fuels and research and the importance of having parity with -- there's nothing wrong with renewables but parity in that research because we are going to continue to need the fossil fuels as well.

Secretary Moniz. Well, first of all, on carbon capture I want to emphasize that's not only about coal. Coal is, obviously, kind of the marquee application in many ways but I believe ultimately we will need it for natural gas and, very importantly, for a whole variety of industrial facilities, and we also support,

like, ethanol plants and natural gas processing plants, et cetera.

So that's important, and I want to emphasize, you know, we have spent $5 billion on CCS. We also have an $8.5 billion loan guarantee program open right now for fossil technologies, et cetera.

But, you know, one of the things that really excites me for the longer term and would have -- and I mentioned -- I just mentioned one example of really breakthrough carbon management possibilities would have enormous implications for how fossil fuels then can be used in the energy economy. One of those is, as I said, the potential for really big-scale CO2 utilization and if I toss out, you know, like a holy grail of that, sunlight, water and CO2 to hydrocarbon fuels. That would be a complete game changer. Some in the fuels industry might be, you know, would be challenged. But that would be, for example, a game changer. There are negative carbon technologies that we should pursue.

So I think, you know, it is -- in terms of coal, when I say coal there's three big thrusts. One is the innovation gender around things like CCS, et cetera.

Another is the transitional assistance to economies and workers in coal country and we just issued $39 million there. And then third is these really big breakthrough possibilities that could change the entire carbon management equation.

Mr. Griffith. Thank you. My time is up. I yield back.

Mr. Olson. The gentleman yields back.

The chair now recognizes the gentlelady from California, Ms. Capps, for five minutes.

Ms. Capps. Thank you, Mr. Chairman. And I want to echo what my colleague, Mr. Barton, said earlier and thank you for -- you're a pretty regular witness here on our committee over your tenure at the White House and you have been by all appearances very willing to answer all kinds of questions on this, which is a most pressing topic. So I thank you for the time you've spent with us.

Your testimony today indicates this is a timely and pressing issue before us. We are currently in a conference level committee trying to negotiate an energy bill that will help define our energy landscape for the next decade.

At the same time, we know these threats from climate change are real. So bold action needs to be taken.

Communities across the nation are already facing the threats of climate change. In fact, I don't call it a threat anymore as much as dealing with the outcomes which we are experiencing, whether through increased storm severity or flooding or, as in California, the crippling impacts of our drought. My area -- five-year drought.

We're building a desal plant. It's very expensive and the technology is pretty precarious. And the massive forest fires that we've had to deal with are very costly, too.

So I believe it is time we stop considering these conditions as anomalies and addressing -- start addressing them as the new normal and we start implementing strategies not only to adapt to these scenarios but to the extent possible mitigate them by reducing our contributions to climate change that's happening.

President Obama has made real progress in laying out a framework to start this transition but there is a lot more work that needs to be done.

We must expand the implementation of existing green technologies such as solar power and increased energy efficiency and invest in the new technologies that will carry us into the future.

Many of our research universities are really leading the way and doing this, which will benefit not only our energy security but our national security and our economy at the same time.

Can you -- you mentioned this in your opening statement but I'd like to give you a little more time to discuss the ways renewable energy and investments in renewable energy and efficiency will bolster our energy and national security.

Secretary Moniz. Uh-huh. Well, I think the -- again, well,

the answer to the last part is, I think, pretty straightforward. Again, the renewable technologies are not looking at -- there's no issue of importing or exporting the fuels.

Ms. Capps. Right.

Secretary Moniz. It's what we have and that's true anywhere in the world, basically. I mean, the mix may be different but that's true anywhere.

So the importance of this as a -- as an element of our energy and national security is, I think, is quite clear. Now, in terms of moving the ball, again, I, of course, am maybe not totally objective but I think innovation is absolutely core to this and that's good news for us because we lead in innovation and we've got to stay the leaders in innovation, particularly because, you know, as one of my -- one of our CEO friends in the industry, Tom Fanning, the head of Southern Company, says you can't keep the waves off the beach.

I mean, we are heading in this direction inexorably in terms of lower carbon and the Paris Agreement, no matter what one thinks about it, it tells you that we are developing a multi-trillion dollar global clean energy technology business. So we also want to be at the -- you know, the head of that train.

Now, cost reduction is critical and we, through innovation and through deployment -- they work together. More deployment,

more innovation drives those costs down. We've seen that now for solar, for PV. We've seen it for wind.

We've seen it for LEDs, which is not quite renewable energy but uses less energy, and now we have to keep that kind of cost reduction pathway going and do it for carbon capture and do it for nuclear and do it for offshore wind as opposed to, you know, the onshore wind progress.

So we've just got to keep at this across the board. I remain an all-of-the-above guy aimed at a low-carbon future where hopefully our industries -- all of our industries, all of our people can be part of that solution.

Ms. Capps. That's right. And just the right amount of time, but a word to say thank you because this path of progress during your administration, your leadership at the department and to the extent that we were able to work with you has really made, I hope, significant progress.

Although, as I said, there's a lot more work to be done but hopefully this is a movement now that will not be questioned as much as it used to be but that we'll see it as progress all along the way.

Secretary Moniz. Innovation. Innovation.

Ms. Capps. Exactly. Innovation. That's a great word.

Thank you.

Mr. Olson. The gentlelady's time has expired. The chair now recognizes a fellow Texan, Mr. Flores, for five minutes.

Mr. Flores. Thank you, Mr. Chairman.

Thank you, Mr. Secretary, for joining us today. The U.S. is now the leading producer of oil and natural gas and how is this new age of energy abundance benefitted our global competitiveness and allowed the U.S. to position itself as a global superpower?

Secretary Moniz. Oh, it is had an enormous impact on natural gas, first of all. First of all, we have not become major importers of LNG. Now we are going to be exporting LNG. We expect to be net natural gas exporters in 2017. The -- but domestically it has both led to a tremendous renewal in manufacturing -- $170 billion capital invested in just in the kind of the chemical arena and, by the way, also reducing carbon emissions.

On the oil side, again, we remain very large crude oil importers but the dramatic decrease in our net oil and oil products imports has had a tremendous balance of payments impact.

Both of them have changed the world energy scene and we are now looked at in a very, very different way.

Mr. Flores. Right. You haven't even talked about the geopolitical implications.

Secretary Moniz. But I -- that's what's I meant.

Geopolitically we are looked at in a very, very different way.

Mr. Flores. Right. Right. I mean, I am talking about from a world security, world stability standpoint. But that's for another day.

So moving on, you've talked about the failure of our nation's infrastructure to keep up with the new dynamics that we have in this energy industry not only with respect to transmission of electricity but also transmission of oil and natural gas.

And so the lack of capacity and the recent opposition to new infrastructure means that the average consumer pays more energy than they should. Are we headed for price spikes again this winter because of the lack of infrastructure under the --

Secretary Moniz. Well, I would not want to predict. But, obviously, there's a vulnerability if the infrastructure is not -- is not there. You know, another polar vortex or who knows what would happen.

Mr. Flores. Right.

Secretary Moniz. But also with that, it is not just -- it is not even just wires and pipes but also, as we pointed out in the QER, inland waterways, dock -- I mean, ports, et cetera.

Mr. Flores. Right. Right. And also cyber as well.

Secretary Moniz. Cyber, yes.

Mr. Flores. Cyber issues. Your QER devotes an entire

chapter to improving North American energy integration. But it makes no mention of the issues that arise with cross-border presidential permitting, in general or in particular the Keystone XL Pipeline.

Do you agree that our current ad hoc or siloed permitting process, as the QER puts it, creates significant uncertainty?

Secretary Moniz. Well, that's what the QER said so therefore we back it.

Mr. Flores. All right. You agree, since it said it.

So that goes to the next question. That is, how has the inability to render a decision on the Keystone Pipeline impacted other energy projects?

Secretary Moniz. I cannot say that I've seen any impact, to be honest. You know, again, I think the QER pointed out -- I've forgotten the exact number but we have a lot of infrastructure crossing the border and, certainly, our electricity systems are essentially integrated with Canada and now with Mexico there's going to be increasing integration there as well.

Mr. Flores. Right. Right. Are you --

Secretary Moniz. In fact, Texas and Mexico, as you know, do trade electricity.

Mr. Flores. Right. Oh, absolutely. We already trade. Texas leads the country in all this.

Secretary Moniz. Correct.

Mr. Flores. Including wind power as well so --

Secretary Moniz. Yes.

Mr. Flores. -- the -- let me ask you this. Are you happy with the time it took to reach a decision on Keystone?

Secretary Moniz. I think that's a question for the Department of State. That's not my responsibility.

Mr. Flores. Oh, okay. All right. I mean, you're the -- you're the head of DOE so you've got a dog in this hunt.

Secretary Moniz. That's a question for the Department of State.

Mr. Flores. All right. Okay.

Is there room to establish a more uniform coordinated modern process for the consideration of cross-border pipelines and electric transmission facilities? I am sure you've got an opinion on this.

Secretary Moniz. Well, it think that what's -- the only thing I would say more broadly, and it applies to also -- it does apply to other DOE responsibilities is I think the Congress has, for good reason, over the years put in all of these statutory, you know, assignments the idea of national interest determinations and I think that's what we do for LNG exports and that's what State does for their responsibilities. We also have

it for cross-border electricity lines.

Mr. Flores. Of course, in my opinion, this is an area where Congress needs to get involved and clean up the statutory underpinnings of the decision making process in this regard. And so I am assuming you'd be willing to provide technical assistance to Congress in trying to formulate this?

Secretary Moniz. We are always happy to provide technical assistance.

Mr. Flores. Thank you very much and I yield back the balance of my time. Thank you.

Mr. Olson. The gentleman's time has expired.

The chair now calls upon the gentleman from Pennsylvania, Mr. Doyle, for five minutes.

Mr. Doyle. Thank you, Mr. Chairman.

Mr. Secretary, first of all, thank you for your service. I've been in Congress 22 years and been through five or six secretaries of energy. You're by far one of the best and you're going to be missed here. So I want to say that right up front.

Just two quick things. I know we all agree on the importance of carbon capture, utilization and storage. There is international consensus that it would be very difficult if not impossible to meet our climate change goals by 2050 without this in place.

And also, without additional investment in this sector -- the electricity sector -- if we try to limit global warming to the 2 degree scenario without it it is going to cost $2 trillion over the next 40 years.

So it is not only necessary to meet the goal but it is necessary to meet the goal in an affordable way. Now, I know the white paper that you issued recently listed several bills here in Congress which would change tax credits or financing options or CCS.

But my question is do you think what we are doing is substantial enough and what other options might we pursue? It seems like we have been talking about CCS forever but it doesn't seem we are any closer to actually seeing, you know, implementation of this technology on a scale where it can be helpful.

And as you said, it is not just coal. It is natural gas, too. And what do we need to do to sort of make this, you know, a moon shot and get this technology out there?

Secretary Moniz. Well, I think, you know, in terms of the -- where we have come, how far or how not far -- depends on how you look at it we have come -- of course, the point is that there is -- there has not been a price signal to the private sector there and I think that's what we need to have for sure.

And I would just make another point, if I might, on this kind of finance side. As you know, the administration has proposed now for two years tax credits for carbon capture, both investment tax credits and storage credits.

In Congress there is a lot of discussion around 45Q as a -- you know, they have some different numbers but fundamentally it is the same idea.

I think a point that has not been appreciated enough and is why I think, you know, Congress addressing this with some urgency is called for is that big capital expenditures by utilities, by investors, et cetera, have a long gestation time and there -- I think that there are two signals that would be very powerful for pushing on CCUS.

One would be something like these tax credits that were put in place for a long period of time. Okay. Now I understand, you know, what I am getting into and, secondly, of course, is the carbon -- the clean power plan does that through the regulatory approach. There are other approaches, obviously, including a direct one.

But all I am saying I think signals now -- it is not, you know, saying look, CCS might be a big deal in 2030 so let's wait. You need the signals now if you're going to get those investments made.

Now, on the research side, it goes back to his need to increase our innovation investments. Now, in fiscal year 2017 -- in 2016 and 2017, you know, we have -- we are moving forward into pilot project scale -- 10 megawatt scale for alternative technologies.

You know, we could take a lot bigger steps with more resources. So I think those are the two areas that are kind of that signal side on finance and carbon management and the innovation.

Mr. Doyle. Thank you.

Let me ask you quickly about nuclear energy, too. You know, we are seeing some of these premature nuclear plant retirements and that could cause a threat to our diversity in power generation.

And I know during the summit you emphasized some of the valuable attributes that nuclear plants provide like carbon-free electricity, high availability, reliable service, fuel diversity and explained that these are not systematically valued by electricity markets.

You further stated that the department is prepared to take action to help address the economic market and valuation challenges for nuclear power.

So could you explain the actions that the department has taken since the nuclear summit to ensure that nuclear plants are

compensated for the energy security, reliability and other benefits they provide to the electricity sector?

Secretary Moniz. We don't have the authorities to take those regulatory actions. But what we have been doing and are doing is doing the studies of how to value those attributes and then that will lead to some recommendations in our quadrennial energy review second installment at the end of the year -- end of the year.

So that's one thing. Now, it is true we also continue to have discussions with FERC, which has -- does have some authorities in terms of the price formation for the -- at the wholesale level. That's going on.

But, of course, a lot of the action is at the states and certainly, one of the notable actions was the New York initiative in August for the so-called clean energy standard, so a kind of technology-neutral carbon approach. That's very important.

Now, the other thing is, in terms of the nuclear plants shutting down is, clearly, the clean -- well, the clean power plant implementation plans and, you know, next year we -- you know, we are rather confident on the court side. 2018 is when the implementation plans are due.

Now, it would seem ironic to have lost zero carbon assets just as states are going forward with implementation plans.

So that's why this -- something like the New York activity and Illinois is considering something similar, I think, are quite important.

Mr. Doyle. Thank you. Thank you very much.

Mr. Olson. Gentleman's time has expired. The chair calls upon the gentleman from Ohio, Mr. Johnson, for five minutes.

Mr. Johnson. Thank you, Mr. Chairman, and Mr. Secretary, I do want to echo the comments of some of my colleagues. It's been a pleasure working with you over the last few years.

You know, as we talk about these important ideas around energy security I am glad to hear you say that you remain an all-of-the-above advocate.

I certainly hope that as you transition -- assuming that you transition out someone else transitions in -- that you will pass that advocacy on to your successor in the sense that, you know, we -- one of these days, because we are problem solvers here in America -- we always have been.

You look back throughout our history. We won't go through the litany but there have been a lot of them. Someday somebody might solve the problem, I suspect, of harnessing the sun's energy and storing it up so that it can be made available on the energy grid for base load. Same thing with wind energy, other alternative energy forms.

I just hope that we can return once again to kind of a common sense approach to an all-of-the-above energy policy where we don't throw out the baby with the bathwater and we are not killing jobs and that we are looking more for market-driven solutions rather than solutions from inside the Washington Beltway because I think the American people are screaming for that.

And I don't think we can forget about the impact that we have made to our communities that have served our energy and national security needs and I hope that we can continue to work together throughout the rest of your tenure and that you also pass along the importance of finding a long-term funding solution for those funding challenges at DOE's cleanup sites like the Portsmouth -- the Piketon facility.

Those are -- those are very important that we keep those projects on a path to completion so that we can redevelop those properties and put them back into good use for the communities that have -- that have given so much already for our energy future.

Mr. Secretary, you know, DOE, as you well know all too well, is central to America's role in international, civil and nuclear commerce markets through what is known as the Part 810 process.

Under the Atomic Energy Act, DOE authorizes certain foreign interactions such as technology transfer and assistance on commercial nuclear power plants provided by our domestic nuclear

industry.

This authorization process has been the subject of scrutiny from both GAO and this committee due to a long bureaucratic approval process and I recognize that DOE has been working to address these criticisms over the last several years by developing and implementing an updated streamlined process. Are you are the deputy secretary monitoring progress of these reforms?

Secretary Moniz. Yes. Yes, we are, in fact, and I would be happy to share with you some data that I saw just maybe two months ago, I think, in terms of some progress actually in terms of shortening the times because there were -- one of the issues is we have managed to with the interagency because it is -- DOE is responsible, again, but yet we work with State and other agencies and what we have, I think, succeeded in is eliminating a lot of serial activity with some parallel activity. And so the data suggests that there has been some progress. I'd be happy to share those with you.

Mr. Johnson. Okay. All right. Can you -- can you send that over to us?

Secretary Moniz. Yes.

Mr. Johnson. That would be great. That would be great.

In the remaining time, I understand DOE after two years of talking about it has not yet deployed its electronic tracking

system to incorporate transparency and accountability into the process and assist applicants.

What is the source of that delay and do you have an estimate for when this new tracking system will be active?

Secretary Moniz. On that, I'll have to get back to you and respond for the record. I am just not up to speed on that.

Mr. Johnson. Okay. You can -- you can respond back on both of those. That would be great, Mr. Secretary.

Good luck to you. I too have enjoyed working with you and I appreciate your sound reasoned approach on most of the issues that we have dealt with here.

Secretary Moniz. Thank you. And Mr. Chairman, may I just make --

Mr. Olson. Yes, sir. Absolutely. Absolutely.

Secretary Moniz. -- I am going back to the congressman's earlier statements. That on the job creation front I do want to emphasize that things like, you know, the renewable space, energy efficiency, we have had tremendous job growth.

So certainly in the energy sector -- and I am not talking about oil and gas production. There is that, too. But we have had tremendous job growth net.

But we also recognize that there are distributional issues. That's not a uniform issue and that's why working with our

communities and talking about transitional activities is quite important.

But the net job growth has been actually quite substantial. Just solar alone is over 200,000 full time jobs.

Energy efficiency jobs, which are a little bit hard to define, I would also be happy to share with you a jobs report that we did earlier this year -- an energy jobs report. It was quite surprising -- 1.9 million jobs associated with energy efficiency in the country.

But we have distributional problems and, obviously, Appalachia is prime among those.

Mr. Johnson. Yes, and the coal industry and the job losses associated with that. It's pretty hard to get my folks to look at a jobs report that shows all of this optimism that you're reflecting when we are seeing communities go into shutdown mode because of the coal industry.

I yield back, Mr. Chairman.

Mr. Olson. The gentleman's time has expired. The chair now calls upon the gentleman from New York, Mr. Tonko, for five minutes.

Mr. Tonko. Thank you, Mr. Chair, and Mr. Secretary, thank you for your bold leadership and for your visionary approach to what is a very difficult policy area, and we as a nation have

prospered from your knowledge base and your determination to make a difference and --

Secretary Moniz. Thank you.

Mr. Tonko. -- for the leadership of the past and, I am certain, into the future, thank you. Thank you for leading us.

The major player in our energy arena -- the utilities -- in the past the tradition was spin those meters, assess the bills, print those bills to the customer and all functioned.

As we transition to transform with technology, with renewable, with research, with distributed generation, with customer choice, how do we bring the utilities along in that effort to make certain that they are able to be as strong a player as possible assisting the growth of commerce and responding to quality opportunities to the residential base and commercial base they serve and at the same time address national security?

There is a big challenge there as we transition and transform. How can we best assist in that effort?

Secretary Moniz. Well, I think with the link to security, certainly, a critical element is their responsibilities and maybe opportunities to address resilience and reliability together because that's a new challenge.

Now, that has to be typically, of course, appropriately internalized in rate structures, which tends to be a state by state

activity.

So I think the Congress would have to think through how it wanted to do that intersection with the states. Perhaps by incentivizing the build-out of infrastructure that we need, particularly for resilience against that entire threat spectrum that I mentioned earlier including climate-induced threats to -- physical threats to cyber and the like.

So I think that is a very, very important part. A second part which, again, would typically be at the state level because it involves the distribution system as opposed to the high voltage transmission lines is the question of what are utilities able to do regulatorily and what are they able to do in a business sense in terms of bundling new services to customers along with electricity supply. Because, again, as I said earlier, we don't anticipate, you know, a big growth in electricity demand.

Maybe even eventually decreasing demand, even as the economy grows. And then that means the business model needs to evolve as well into -- probably into new services.

Mr. Tonko. Okay. Well, as you know, in New York, my home state, the rev process is underway and everyone is waiting for what that produces because it does, I think, look very strategically at the transformation taking place in this industry.

And, again, with having lived through Super Storm Sandy, we saw what worked and what didn't. Distributed generation had a major plus report card after that aftermath of Super Storm Sandy. So --

Secretary Moniz. Right. And New York is certainly a leader and also, I might say, not in the policy arena but also integrated with its very strong in iCERT and the strong R and D as well at a state level.

Mr. Tonko. My old digs before I came here so thank you for mentioning them.

What do commitments to mission, innovation and other investments in clean energy research mean to a stronger outcome for national security?

Secretary Moniz. Well, I think it is absolutely critical because, as we said, first of all, the whole clean energy push is part and parcel of a modern energy security picture.

So I've said it before that I think that -- well, I've said it also here -- there is also an enormous economic opportunity that we have to take advantage of and it wasn't exactly a question but I want to emphasize that the question of doubling our innovation budget raises the question of, you know, do you have the capacity to absorb it well.

I think we have so much unused capacity for innovation in

this country that that will not be a problem and I can go through examples, like, with ARPA-E, for example, where we are funding, you know, 2.5 percent of the proposals in a program that is by any logical measure extremely successful.

So I think there is a big payoff for us in the economy, in environment and security with that kind of investment.

Mr. Tonko. I agree. Having watched some of those activities, the ripple effects of sound jobs -- sound paying jobs that are associated with that too is also a shot in the arm for the economy.

Secretary Moniz. To me, it is that and the infrastructure renewal agenda which is just absolutely critical.

Mr. Tonko. Again, Secretary, thank you and we are all made stronger because of your leadership.

Secretary Moniz. Thank you.

Mr. Olson. The gentleman's time has expired.

The chairman calls on the gentleman from New York, Mr. Engel, for five minutes.

Mr. Engel. Mr. Secretary, you get two New Yorkers in a row. That's pretty good.

First of all, I want to add my voice to the thanks and the accolades that have been given to you. You have been accessible. You have been intelligent. You've been just terrific, not only

with Energy and things that this committee does but, you know, on the Iran deal you were right up front and answering questions. And we didn't always agree but you were always brilliant so I want to just thank you for your hard work.

Secretary Moniz. Thank you.

Mr. Engel. We really appreciate it. I want to start by talking about offshore wind energy. That hasn't really been talked about very much here today. A small percentage of our global wind energy is generated offshore and much of the capacity is in northern Europe. But we are now starting to invest here in the United States.

The first offshore wind farm is set to begin commercial operation in early November and several others are being developed. And in New York the Long Island Power Authority is currently working to approve a 90-megawatt wind farm that would become the largest in the United States.

So can you talk a little bit about that, what your take is on the future appetite for offshore wind generation in the U.S.? What are the challenges, security or otherwise, that the federal government needs to address with this?

Secretary Moniz. Yes. Well, this is a very interesting time for offshore wind. As you mentioned, the Block Island project -- the 30-megawatt project will be -- actually they

finished construction and they will start getting into the grid in November. So that's the first U.S. wind farm -- offshore wind farm.

Number two, actually last Friday, Secretary Joule and I released a jointly developed offshore wind strategy, and if you haven't seen that we'd be happy to shoot that over to you --

Mr. Engel. Thank you.

Secretary Moniz. -- to kind of lay out a bunch of the issues. And by the way, one of the issues is not just only -- kind of the technology we think about but there is a lot more data we need to understand the development of offshore wind.

Third, I do want to emphasize that in the Block Island project I showed this -- that there is really excellent collaboration between the wind people and the wildlife -- like the Wildlife Federation protecting right whales and this kind of thing. So I think that's an important part of the development. That's kind of going well.

Then I think we are now also moving into an arena where we will start to see floating platforms and we have three pilot projects -- one in Maine, one in New Jersey -- in Jersey-New York area, Fisherman's Wharf -- and one in Lake Erie, the so-called North Coast -- that are looking at novel technologies.

Two -- the Maine project in particular is a floating platform

that will ultimately be for deepwater. There is discussion of a massive deepwater wind farm off of Hawaii as well.

So I say all of this that I think it is the same story I said earlier. Technology, development and deployment going hand in hand to drive cost down. So I think we are now at that place for offshore wind where we can anticipate that kind of trajectory of getting the cost down.

Now, the Block Island project PPA I think is, like, 24 cents per kilowatt hour. Of course, for an island like that, that is a lot less than they are now paying by bringing in diesel fuel.

So I think -- you know, I think we are at that beginning of that virtuous cycle of technology and deployment and cost reduction and then we will see much more.

Mr. Engel. It's really exciting. I want to talk about one other thing and that's the -- your testimony, which we have read, touched on the increasing electrification of certain aspects of our economy including telecommunications and transportation and I want to talk a little bit about how the relationships among these sectors apply to the emergency response capabilities.

Talk a little bit about Hurricane or Super Storm Sandy. When it hit the East coast in 2012 it is impact on energy infrastructure was, obviously, especially devastating and it illustrated in many ways that our energy systems were vulnerable to disruption because

we all know more than 8 million people lost power and field distribution networks were paralyzed and service stations couldn't pump gas into New York and New Jersey and critical terminals for petroleum and petroleum products were badly damaged.

Since that time, we have instituted a wide range of policies and procedures designed to better protect our citizens and infrastructure and we have made tremendous improvements. But it is still a work in progress.

Mr. Tonko talked about distributed generation. In your view, what are the biggest remaining vulnerabilities that need to be addressed and what steps should the government and the private sector take next?

Secretary Moniz. Well, we -- certainly for Sandy and, obviously, Katrina and Rita and go through the list -- certainly, in the coastal areas the reality is that we have to be preparing much more and hardening our infrastructure for the inevitable, continually increasing sea level and water temperature which both contribute to the amplification of storm surges and the damage that we have seen.

So there is a lot of blocking and tackling there that we have to do. I mentioned earlier, for example, Florida Power and Light. You know, they are going through replacement of all the,

essentially, the wooden poles. They are worried about the substations that are in flood areas.

But as they are doing it and I think, you know, I am sure they could do other things too but I give them credit -- as they do the kind of straightforward hardening, at the same time they integrate smart technology.

So they are getting resilience, reliability and the possibilities also of more information for managing the grid. So I think there is a lot of that that we have to do.

A second point I'll make and, again, in New Jersey, we have -- we did a project with our Sandia laboratory after Sandy was to design a major micro-grid system with distributed energy that will sustain the electrified transport corridor, which is a critical public safety issue. That went down, too, with Sandy.

So there is also now getting that kind of micro-grid structure to make sure that really critical pieces of infrastructure can operate during these storms. So that's important, and this -- there is a whole string of things but those are some examples.

Mr. Engel. Okay. Thank you, and once again, thanks for all you've done. We very much appreciate it.

Secretary Moniz. Thank you.

Mr. Olson. The gentleman's time has expired.

Mr. Secretary, it is over. I want to close by saying thank you so very much for your patience, your expertise and your frankness.

In Texas, we say you're a straight shooter. That's a very high compliment. No matter what happens in the future, I want you to know you have a standing invitation to come to Texas 22, my district, to see the Petra Nova project up and running.

A big part of that at MIT and at DOE, as you know she's coming online this December. She will capture 95 percent of the CO2 out of one stack of carbon that's made by coal -- powered from coal, capturing 95 percent of CO2, use it to get oil -- an old oilfield about 65 miles south.

It's the first viable -- economically viable carbon capturing sequestration project in America and a big project. So thank you, thank you, thank you.

Secretary Moniz. And we are excited about it.

Mr. Olson. We are as well. If you come by too -- give us a little more time. Best barbecue at the Swingdoor up there in Rosenberg and actually pop by also Rosenberg -- Bob's Taco Station, the best tacos in Fort Bend County.

With that, members, you have five days to submit questions for the record.

Without objection, this hearing is adjourned.

Secretary Moniz. Thank you.

[Whereupon, at 12:28 p.m., the Subcommittee was adjourned.]